(12) UK Patent Application (19) GB (11) 2 139 102 A

(43) Application published 7 Nov 1984

(21) Application No 8308472

(22) Date of filing 28 Mar 1983

(51) INT CL³
A63B 23/04

(52) Domestic classification
A6M 8L2 8LY

(58) Field of search
A6M

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(54) Balance training equipment

(57) The equipment comprises a platform (13) having a longitudinally extending channel (14) on the underside thereof comprising two parallel flanges (17) between which engages the rim (23) of a wheel (19) which is formed as a rolling support on an extended axle (22) having two lateral wheels (20, 21) which are of slightly smaller diameter than the centre wheel (19) so as to allow the platform to tilt about its longitudinal axis between a balance position on the wheel (19) alone and an inclined position to either side where it contacts the side wheels (20 or 21) and these latter rock into contact with the ground, as well as rocking movement over the periphery of the wheel (19) about the axis defined by the axle of the rolling support. Alternatively, the rolling support may be provided by a compound which assembly having more than one axis or by a ball located in a channel lined with cylindrical or spherical rollers.

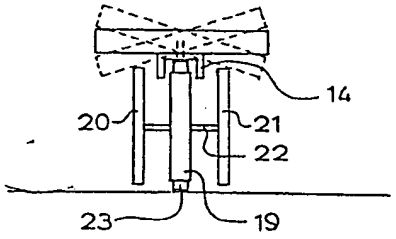

FIG. 2

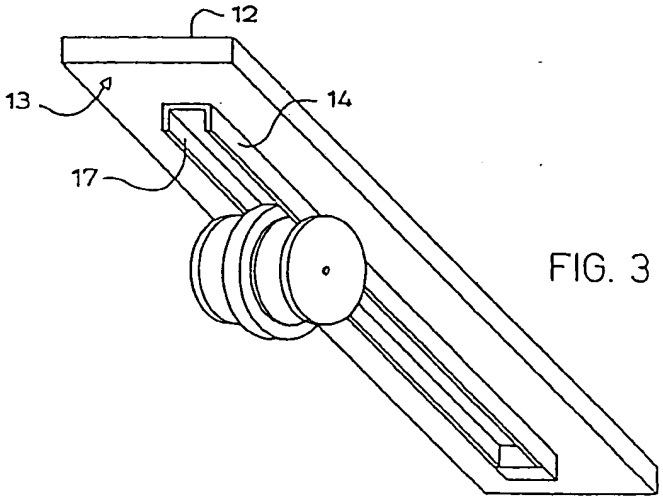

FIG. 3

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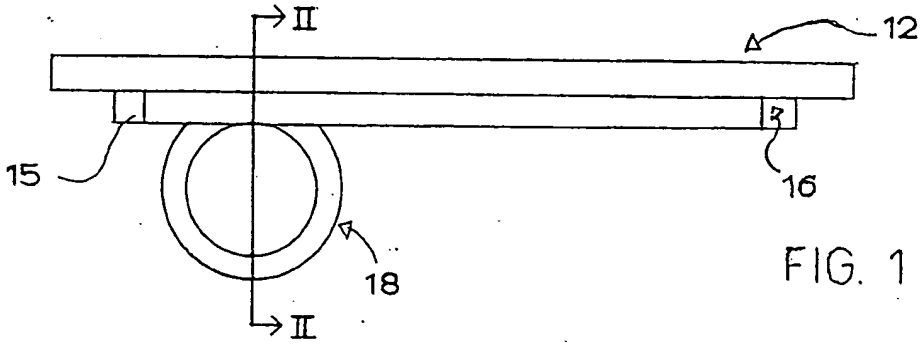

FIG. 1

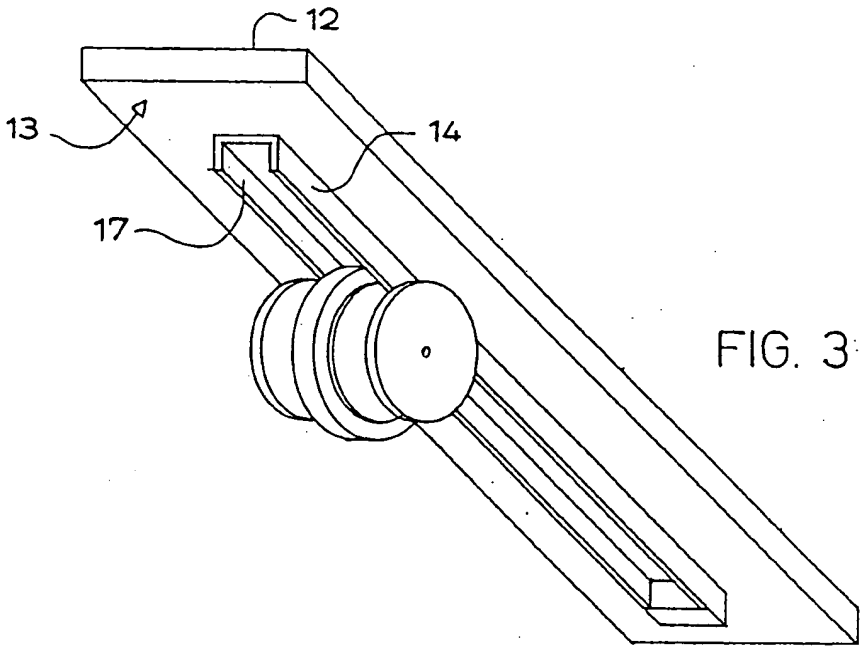

FIG. 3

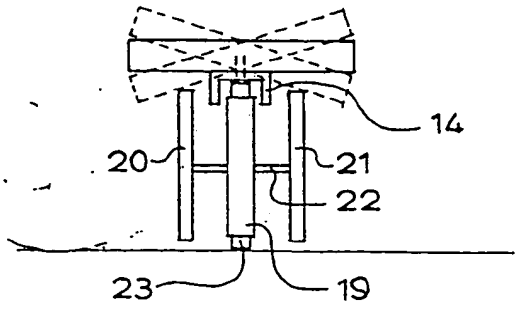

FIG. 2

SPECIFICATION

Balance training equipment

The present invention relates to balance training equipment, and to a device which can be used, not only for serious training, but also for entertainment and recreation.

Recently much attention has been given to so-called "skate boards" which comprise a rigid platform mounted on four wheels like an enlarged version of a conventional roller skate. The mountings for the wheels allow the curved path to be followed by the user putting his weight on one side or the other of the board and considerable skill in maintaining balance is required to perform some of the movements and to follow the obstacle courses which are provided for skate boarding. Such skate boards are, however, limited in operation since they are restricted to rolling movement in a fore and aft direction and the only available displacement movement is about the roll axis in order to achieve the above mentioned curving path. No displacement movement about the yaw axis or the pitch axis can be made because of the four wheels in contact with the ground. The terms "yaw", "pitch" and "roll" are used in their conventional sense to have the following significance:

"yaw" means displacement movements about a vertical axis passing through the apparatus;

"pitch" means turning movement about a horizontal axis transverse to the direction of movement of the equipment; and

"roll" means turning movement about a longitudinal horizontal axis parallel to the direction of movement.

Because of the above limitations skate boards cannot provide a full range of rolling and turning movement to test the skill of the user in the same way as, for example, a surf board floating in the sea does because in the latter case displacement can take place about all three axes whereas a skate board on dry land only moves about the roll axis. The present invention seeks to provide balance training equipment, also usable for leisure activities, in which extra control for balance is required and displacements can take place about the yaw, pitch and roll axes individually oir simultaneously.

According to one aspect of the present invention, therefore, balance training equipment comprises a platform on which user can stand, and a rolling support for the platform on the ground, the rolling support allowing the platform to tilt, at least to a limited extent, about two orthogonal axes lying in a generally horizontal plane and allowing the platform to turn about an axis normal to this plane.

In a preferred embodiment of the invention the rolling assembly comprises a set of three wheels on a common axis. Such three wheels may be fixed to the said common axis, or may be individually freely rotatable on the axis. This latter arrangement allows a greater freedom of movement since with two wheels in contact with the ground each may roll in an opposite directional sense about the common axis allowing free turning movement of the said common axis about an axis normal thereto or generally normal thereto.

In the preferred embodiment of the invention the middle wheel of the set of three has a larger diameter than the two outerwheels and is in contact with the un erside of the platform at its periphery, the platform being able to rock about the point of contact with the perimeter of this middle wheel between limits imposed by contact of the platform with each of the two lateral wheels.

The platform may be interengaged with the rolling support in one of a number of ways. For example, as in the preferred embodiment, the middle wheel may be located with its rim engaged in a channel formed or attached to the underside of the platform. In this latter case the channel is preferably secured as an additional element to the underside of the platform although if the platform itself is made of adequate thickness the channel may be formed in the material of the platform.

The difference in diameter between the middle wheel and the two lateral wheels may be achieved by providing the middle wheel with a resilient tyre the dimensions of which are such that it fits closely into the channel. The dimensions of this tyre may be greater in the radial direction and corresponding dimensions of similar tyres fitted to the lateral wheels, or the lateral wheels may be provided with no tyre, but rather made simply of a resistant resilient material.

Other arrangements of rolling support assembly may be provided in order to achieve the required tilting movements about the yaw, pitch and roll axes. For example, the rolling support may be largely provided by a ball located in a suitable roller channel fitted under the platform, or a compound wheel assembly having more than one axis may be employed. In the former case the channel may be lined with a plurality of rollers, in the form of balls or cylindrical rollers, to encourage the ball to roll in either of two directions, that is along the channel or transversely of the channel. When rolling trans ersely of the channel, of course, the ball will not move in relation to the platform, but the platform will move laterally with respect to the ground and consequently the axes of cylindrical rollers, if such are provided, which lie generally parallel to the length of the channel.

One embodiment of the present invention will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view of the embodiment;

Figure 2 is a cross section taken on the line II-II of Figure 1; and

Figure 3 is a perspective view from below of the embodiment illustrated in Figures 1 and 2.

Referring now to the drawings, the balance training equipment illustrated generally comprises a flat platform 12 of suitable size for an operator to stand on with feet spaced slightly apart. Without loss of generality it can be said that a suitable dimension has been found to be about 70cm × 20cm, although, of course, other dimensions may be employed if preferred. The platform 12 in the illustrated embodiment is generally rectangular, although it could be

formed with shaped ends if preferred. The under surface, generally indicated 13 of the platform 12 has a channel section element 14 secured thereto by screws passing through the platform 12 and into the channel 14. Two end stops 15, 16 are located, one at each end of the channel 14 to close the interior 17 of the channel at the ends.

The platform 12 is carried by a rolling support generally indicated 18 and comprising a wheel assembly having a middle wheel 19 and two lateral wheels 20, 21 all fitted to a common axle 22, The lateral wheels 20, 21 may be fixedly sec red to the axle 22 or may be freely rotatable on the axle 20, but retained laterally thereon. The three wheels 19, 20, 21 are all identical in dimensions and structure, but the middle wheel 19 is additionally provided with a tyre 23 which is a stretch fit onto the wheel and has a rectangular cross section as illustrated in Figure 2. The tyre 23 has a width and radial dimension such as to engage in the interior 17 of the channel 14 and is sufficiently rigid to hold the two component parts of the equip ent together under the normal stresses experienced during use. As can be seen in Figure 2, the presence of the tyre 23 on the middle wheel 19 holds the two lateral wheels 20, 21 spaced from the ground when the equipment is in a perfectly horizontal position, and the platform 12 can thus rock about its point of contact with the tyre 23 about a longitudinal central axis between the two angular end positions illustrated in broken outline in Figure 2.

This provides the "roll" axis freedom ofmovement of the platform 12. Obviously, of course, the platform 12 can roll about an axis parallel to the axis 22 and passing through the point of contact between the tyre 23 and the channel 14 between end positions determined by contact at each end, respectively, of the platform 12 with the ground. Finally, the platform 12 can be "spun" about a vertical axis either with only the tyre 23 in contact with the ground or with the tyre 23 of the middle wheel 19 and one or other of the lateral wheels 20, 21 in contact with the ground. For this latter purpose it may be considered preferable for the lateral wheels 20, 21 to be freely rotatably mounted on the axle 22 rather than fixed although the frictional contact between the wheels and the ground and between the wheels and the underside 13 of the platform 12 will not be sufficiently great as substantially to preclude such movement even if the wheels 20, 21 are rigidly fixed to the axle 22.

In use a user stands on the platform 12 with feet on the upper surface and straddling the point of contact between the wheel 19 and the channel 14 so that by transferring his weight from one foot to the other a balanced position can be established. By "rocking" his hips the user can ca se the equipment to roll, and upon rolling the rolling support assembly 18 will also displace along the channel 14 to an asymmetrical position which will necessitate a change of the weight distribution between the feet in order to maintain balance. Twisting and rocking movements also complicate the balance situation making it very difficult to maintain balance so that a user will be able to stand on the board only by skillful and expert manipulation of his weight distribution with respect to the platform 12. This simulates very closely the yaw, pitch and roll movements which are experienced on a surfboard and the equipment thus constitutes a good "dry land" simulation trainer for surfing or wind surfing and enables a user to develop the necessary balancing skills quickly and without the constant wetting involved in surf board practice.

CLAIMS

1. Balance training equipment comprising a platform on which the user can stand and a rolling support for the platform on the ground, the rolling support allowing the platform to tilt, at least to a limited extent, about two orthogonal axes lying in a generally horizontal plane, and to turn about an axis normal to this plane.

2. Balance training equipment as claimed in Claim 1, in which the rolling support comprises a set of three wheels on a common axes.

3. Balance training equipment as claimed in Claim 2 in which the said three wheels are fixed for rotation together on the said common axis.

4. Balance training equipment as claimed in Claim 2 or Claim 3, in which the intermediate wheel of the said three wheels is shaped to be engageable at its periphery in a longitudinal channel extending along the undersurface of the said platform to be retained therein against displacement by the weight of the user during operation of the equipment.

5. Balance trainig equipment as claimed in Claim 4, in which the said channel is secured as an additional element to the underside of the said platform.

6. Balance training equipment as claimed in any of Claims 2 to 5, in which the intermediate wheel of the said three wheels has a larger diameter than the outer two wheels.

7. Balance training equipment as claimed in Claim 6, in which the said intermediate wheel has a tyre which fits into the said channel

8. Balance training equipment as claimed in Claim 1, in which the rolling assembly comprises a ball having two circumferential grooves therein, engageable in parallel longitudinally extending flanges of a channel member whereby the ball is constrained to roll longitudinally of the support but allows rocking movement about two orthogonal horizontal axes when the equipment is placed on a horizontal surface.

9. Balance training equipment, comprising a platform, means defining an elongate channel on the underside of the platform, and a rolling support assembly comprising a main wheel, the width of which at the rim is such that it engages within the channel to be retained therein for rolling movement longitudinally thereof, and subsidiary wheels on a common axle with the main wheel and having a smaller diameter than the main wheel so as to allow the platform to rock on the support assembly about an axis parallel to the axis of the rolling support assembly and an axis perpendicular thereto.

10. Balance training equipment substantially as

hereinbefore described, with reference to and as shown in the accompanying drawings.

Printed in the UK for HMSO, D8818935, 9/84, 7102.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.